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Overview of the study

This study uses a new longitudinal dataset that combines information from the Postsecondary Information System (PSIS) with personal income tax data to examine the labour market outcomes of graduates from universities in the Maritime provinces (Prince Edward Island, Nova Scotia and New Brunswick). In this pilot study, the outcomes of six cohorts of young people who graduated from a university in the Maritime provinces between 2006 and 2011 are examined, including 37,425 undergraduate degree holders (those with a bachelor's degree) and 6,740 graduate degree holders (those with a master's degree or a doctorate).

- From 2006 to 2011, at least 95% of graduates from the Maritime universities reported employment earnings in their first year after graduating, which suggests that most of them had a paid job at some point in the year after graduating.
- One year after graduating with a bachelor's degree, the earnings of graduates from the 2009 cohort (who graduated in the aftermath of the 2008/2009 recession) were 8% lower than the earnings of their counterparts from the 2008 cohort.
- Subsequent cohorts did not recover. Undergraduate students who graduated in 2010 and 2011 also had lower first-year earnings than those who graduated in 2008.
- In comparison with the 2008 cohort, the first-year earnings of undergraduate degree holders from the 2011 cohort were lower for both men and women, for those who left and those who stayed in the Maritime provinces, and for nearly all fields of study.
- Approximately two-thirds of graduates were still living in the Maritimes one year after graduating. Those with a degree in education were the most likely to stay in the Maritimes, while those with a degree in architecture, engineering and related technologies were the least likely to stay.

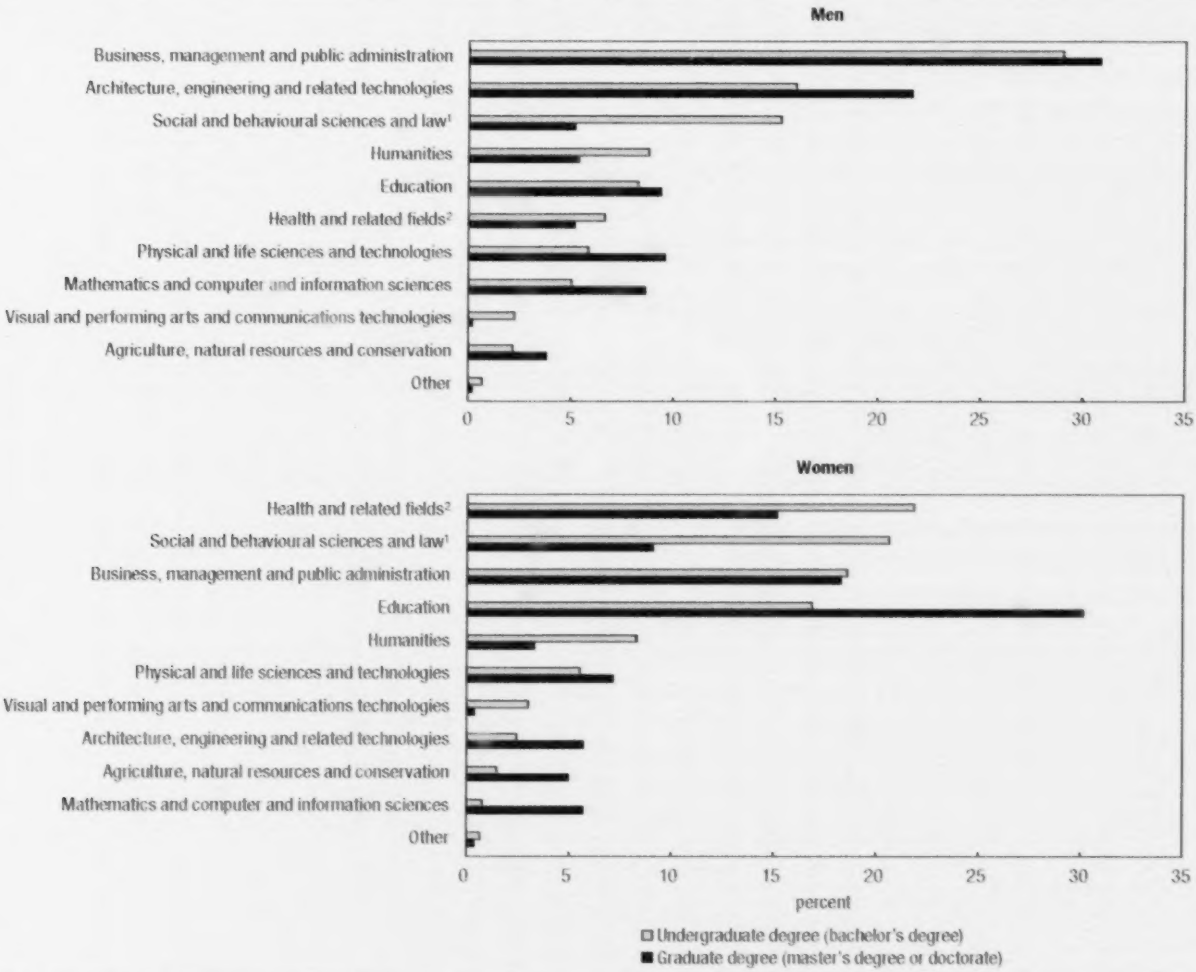
Introduction

Labour market transitions and outcomes of postsecondary graduates have always been a topic of interest for policy makers, students, their families and postsecondary institutions. Although higher levels of education are usually associated with better labour market outcomes,[1] postsecondary education requires considerable financial and time investment and may not always provide the expected returns, particularly around recessions.[2]

Statistics Canada has recently developed the Education Longitudinal Linkage Platform (ELLP), which allows for the combination of administrative data on the Postsecondary Student Information System (PSIS) with other databases to enable longitudinal analysis and a better understanding of labour market outcomes following graduation (see "Data sources, methods and definitions"). A pilot project[3] was recently undertaken using the ELLP to examine the outcomes of graduates from Maritime universities from 2006 to 2011 by combining PSIS data for Prince Edward Island, Nova Scotia and New Brunswick with personal income tax data.[4] Over the years, the platform will also allow for the addition of more information from multiple sources, which will provide a better understanding of the factors behind access to postsecondary education (PSE), persistence and success in PSE, and the labour market outcomes of graduates.

Using that new dataset, this article looks at the labour market outcomes of graduates from the Maritime universities, with a special focus on differences by year of graduation. Canadian and international economies experienced significant shifts from 2006 to 2011 due to recessions in Canada, the United States and Europe, credit crises and variations in commodity prices. These events may have affected the availability of jobs in the Maritimes and across Canada, and they may have presented different challenges to graduates entering the labour market before and after the 2008-2009 recession. The

Chart 1
Distribution of Maritime university graduates under the age of 35, by field of study and education level, all cohorts from 2006 to 2011



1. Undergraduate and post-bachelor non-graduate-level degrees in law (LLB, JD, BCL) were removed from the social and behavioural sciences and law grouping for this study.
2. Undergraduate and post-bachelor non-graduate-level degrees for family doctors (MD), dentists (DDS, DMD) and veterinarians (DVM) were removed from the health and related fields grouping for this study.
Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

new dataset therefore provides a unique opportunity to compare the economic outcomes of graduates who earned their degree between 2006 and 2008 with those of later cohorts.

Specifically, this paper examines the employment earnings and employment insurance (EI) benefits of university graduates and provides an overview of job quality indicators such as unionization (based on union contributions), pension plan coverage (based on private pension plan contributions) and the proportion of those who are employed in low value-added service industries. In addition to presenting the outcomes by cohort, results are also shown for men and women, by education level (for undergraduate and graduate degree holders), and by field of study. The analysis focuses on individuals who graduated prior to the age of 35[5] who also completed an income tax return and did not pursue their education on a full-time basis after graduating.[6] Individuals who reported self-employment earnings[7] were excluded.

Tax data can also be used to identify the place of residence of graduates at different points in time. This information can be used to calculate a regional retention rate that corresponds, in this paper, to the number of graduates still living in one of the three Maritime provinces, one year after graduating, as a proportion of all graduates who obtained a degree from Maritime universities. The retention rate is discussed in a box at the end of the article (see "Retention of Maritime university graduates"), with results shown by place of origin, sex and field of study.

Profile of Maritime university graduates

This analysis is based on a population of 37,425 individuals under the age of 35 – or about 6,200 people each year – who graduated with an undergraduate degree (i.e. a bachelor's degree) from the universities of Prince Edward Island, Nova Scotia and New Brunswick, and met the criteria described above. The sample also includes 6,740 individuals (about 1,100 per year) who obtained a graduate degree (master's degree or doctorate) over the same period.[8]

In this population of graduates, nearly two-thirds (62%) were female. The proportion was similar across education levels (undergraduate and graduate degrees) and across cohorts. A little more than 5% of the undergraduate degree holders graduated in Prince Edward Island, 58% in Nova Scotia and 37% in New Brunswick. Among those who obtained a graduate degree, 2% did so in Prince Edward Island, 77% in Nova Scotia and 21% in New Brunswick.

At the undergraduate level, more than three-quarters (78%) of women graduated from four fields of study, while just over two-thirds (69%) of men came from four disciplines (Chart 1). The most common fields also differed by sex. For women, the top fields (in descending order) were health and related fields; social and behavioural sciences and law; business, management and public administration; and education. Among men, the top fields were business, management and public administration; architecture, engineering and related technologies; social and behavioural sciences and law; and humanities.

At the graduate level (master's degree and doctorate), 73% of female graduates were in four fields of study, while 71% of males graduated from four fields. Once again, the

Table 1
Selected labour market indicators for Maritime university graduates one year after graduation, by cohort and education level, 2006 to 2011

	Cohort					
	2006	2007	2008	2009	2010	2011
	number					
Undergraduate degree (bachelor's degree)	**6,110**	**6,645**	**6,310**	**6,280**	**5,915**	**6,165**
	percent					
Proportion of graduates						
With earnings	97.1	97.0	97.1	96.9	96.7	96.6
With employment insurance benefits	14.1	13.0	15.3	17.5	16.9	15.3
With social assistance benefits	0.3	0.5	0.4	0.6	0.5	0.4
	number					
Graduate degree (master's degree or doctorate)	**995**	**965**	**1,080**	**1,165**	**1,230**	**1,305**
	percent					
Proportion of graduates						
With earnings	96.0	94.8	95.8	95.7	95.9	96.6
With employment insurance benefits	12.6	11.9	13.4	14.2	13.8	14.6
With social assistance benefits	0.0	0.0	0.0	0.4	0.4	0.4

Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

top fields differed by sex. Among women, the top four fields were the same as those of undergraduate degree holders, except that education was the top field rather than health and related fields. Among men, business, management and public administration, as well as architecture, engineering and related technologies remained among the four most popular fields of study, followed by physical and life sciences and technologies and education.

Most graduates reported employment earnings in their first year after graduating

During their first year after graduating, most graduates had a paid job at some point—at least 95% of them reported employment earnings on their tax return (Table 1). This proportion was similar for each cohort of graduates and for both levels of education.

The proportion of undergraduate degree holders who had received employment insurance benefits (EI) one year after graduating increased from 14% to 18% for the 2006 and 2009 cohorts, but decreased to 15% for the most recent cohort (2011).[9] Although they were less likely to report receiving EI benefits, similar trends were observed among cohorts with a graduate degree. Very few graduates received social assistance benefits the year after graduating (less than 1% for all cohorts and both levels of education).

Declines in first-year earnings began with the 2009 cohort

From 2006 to 2008, the median first-year earnings[10] of undergraduate degree holders remained relatively constant, at around $35,000 (Table 2). Over the same period, it grew from $53,200 to $56,100 among graduate degree holders.

The years 2008 and 2009 were characterized by the most important economic downturn since the beginning of the 1990s in Canada. Between 2008 and 2009, the first-year earnings of graduates declined by 8%—both at the undergraduate and graduate levels. These differences represented a decline of nearly $3,000 for undergraduate degree holders and a decline of $4,500 for graduate degree holders. Subsequent cohorts in 2010 and 2011 did not recover from the decline.

These trends were similar for both male and female graduates (Chart 2). In both cases, first-year earnings decreased between the 2008 and 2009 cohorts, and subsequent cohorts did not recover.[11]

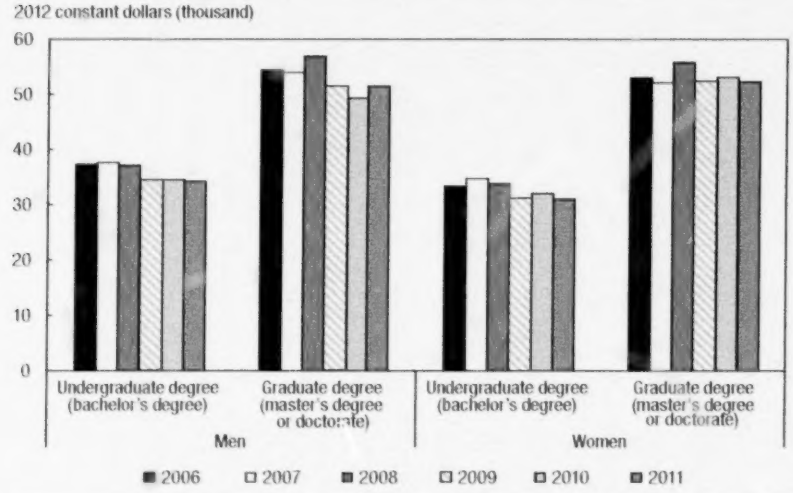
Table 2
Labour market outcomes of Maritime university graduates one year after graduation, by cohort and education level, 2006 to 2011

	Cohort					
	2006	2007	2008	2009	2010	2011
	number					
Undergraduate degree (bachelor's degree)	**6,110**	**6,645**	**6,310**	**6,280**	**5,915**	**6,165**
	2012 constant dollars					
Median earnings[1]	34,800	35,800	35,200	32,400	32,900	32,300
	percent					
Earnings categories						
$0	3.0	3.0	2.9	3.1	3.3	3.4
$10,000 or less	8.3	8.4	8.5	9.0	8.4	8.5
$10,001 to $30,000	29.5	28.3	30.2	34.0	33.2	33.7
$30,001 to $50,000	35.4	34.0	32.1	29.4	30.0	31.1
more than $50,000	23.8	26.3	26.4	24.5	25.1	23.3
Proportion of graduates						
Working in low value-added service industries[2]	15.0	15.1	16.3	18.7	17.0	17.6
Reporting a union contribution	37.5	37.1	36.2	37.6	39.5	36.0
Reporting a private pension plan contribution	36.2	36.9	37.4	35.8	35.0	31.8
	number					
Graduate degree (master's degree or doctorate)	**995**	**965**	**1,080**	**1,165**	**1,230**	**1,305**
	2012 constant dollars					
Median earnings[1]	53,200	52,900	56,100	51,600	51,600	52,200
	percent					
Earnings categories						
$0	4.5	5.7	4.2	4.3	4.1	3.4
$10,000 or less	3.5	4.1	3.2	5.2	5.3	4.6
$10,001 to $30,000	11.6	10.4	11.6	13.7	13.4	14.6
$30,001 to $50,000	25.1	24.9	20.8	24.0	24.4	23.8
more than $50,000	55.3	54.9	60.2	52.8	52.8	53.6
Proportion of graduates						
Working in low value-added service industries[2]	5.9	6.9	7.2	8.5	7.1	5.7
Reporting a union contribution	47.8	48.8	53.2	51.4	49.7	51.5
Reporting a private pension plan contribution	51.4	51.9	55.2	53.0	51.2	48.9

1. The median also includes graduates with no earnings. Earnings are expressed in real terms. First-year earnings refers to employment earnings in the first calendar year following the year of graduation.
2. Low value-added service industries traditionally offer lower wages and fewer non-salary benefits than other industrial sectors and are concentrated in retail sales; accommodation and food services; and other services.

Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

Chart 2
Median earnings of Maritime university graduates one year after graduation, by cohort, sex and education level, 2006 to 2011



Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

Although most graduates held a job at some point during their first year after graduating, the data do not provide any indication as to whether the job was full time or part time, or whether it was held part of the year or throughout the entire year. The new dataset on Maritime university graduates also does not provide information about the number of hours worked during the year, or whether the job is in the same field of study. However, additional insight can be obtained by examining the distribution of graduates across earnings categories.

Between 2006 and 2011, the proportion of undergraduate degree holders who earned between $0 and $10,000 remained relatively stable from one cohort to the next, varying between 11% and 12%.

The proportion of those earning between $10,001 and $30,000, however, grew by 4 percentage points between the 2006 and 2009 cohorts; the largest increase was observed between the 2008 and 2009 cohorts. Conversely, the proportion of those earning between $30,001 and $50,000 decreased during the same period, while the proportion earning more than $50,000 fluctuated between 23% and 26%.

Similar trends were observed among graduate degree holders. There was an increase in the $10,001 to $30,000 category and a decrease in the two highest earnings classes; most of the changes occurred between the 2008 and 2009 cohorts.

These shifts in earnings classes may be the result of a reduction in working hours from one cohort to the next,[12] but they could also be due to a higher proportion of graduates working in low-paid jobs. Tax data do not provide information on working hours, but they do provide information about the industries in which graduates are employed. Additional insight can thus be obtained by examining the proportion of workers in low value-added service industries, which are defined in this paper as retail trade, accommodation and food services, and other services. On average, jobs in these industries offer lower wages and fewer benefits than jobs in other sectors.[13]

The proportion of undergraduate degree holders working in such industries increased from 15% to 19% between the 2006 and 2009 cohorts; most of the increase occurred between the 2008 and 2009 cohorts. Among graduate degree holders, the proportion working in low value-added service industries was smaller and fluctuated less over the period. This raises the possibility of an increasing proportion of undergraduate degree holders who may have had no other option but to work in low-paid jobs because of a deterioration in labour market conditions. However, the data do not contain any information on the reasons for working in a given industry.

Lastly, two other important job quality indicators available from the Maritime university graduate dataset are the unionization rate and private pension plan coverage. Using tax data, unionization can be approximated by the proportion of graduates who reported union contributions. While this proportion fluctuated from cohort to cohort, the results do not point to a long-term growth or decline across cohorts. Of note, graduate degree holders were more likely to report union contributions (with proportions between 48% and 53%) than undergraduate degree holders (between 36% and 40%).

Similarly, graduates covered by a private pension plan can be approximated by the proportion of graduates who reported contributions to a registered pension plan. This proportion fluctuated from cohort to cohort in the year after graduation, ranging between 32% and 37% for undergraduate degree holders and from 49% to 55% for graduate degree holders.

Declines in first-year earnings took place in nearly all fields of study

Earnings in the first year following graduation vary considerably across fields of study.[14] Male bachelor's degree holders from the 2008 cohort, for example, had median first-year earnings of $37,100, but that amount varied between a high of $55,700 in health and related fields[15] and a low of $14,700 in visual and performing arts and communications technologies (Table 3). It is important to note, however, that not all graduates were working in occupations corresponding to their field of study.[16]

Among female bachelor's degree holders from the same cohort, the overall median was $33,800, but

Table 3
Median first-year earnings[1] of Maritime university graduates, by sex, education level and field of study, 2008 and 2011 cohorts

	Men				Women			
	Median first-year earnings			Proportion of graduates	Median first-year earnings			Proportion of graduates
	2008 cohort	2011 cohort	2008 to 2011 cohorts	2006 to 2011 cohorts combined	2008 cohort	2011 cohort	2008 to 2011 cohorts	2006 to 2011 cohorts combined
	2012 constant dollars		percentage change	percent	2012 constant dollars		percentage change	percent
Undergraduate degree (bachelor's degree)								
All fields of study	**37,100**	**34,200**	**-7.8**	**100.0**	**33,800**	**31,000**	**-8.3**	**100.0**
Education	42,900	33,800	-21.2	8.3	39,200	29,900	-23.7	16.9
Visual and performing arts and communications technologies	14,700	20,200	37.4	2.3	16,700	17,200	3.0	3.0
Humanities	22,200	20,900	-5.9	8.8	18,300	19,100	4.4	8.3
Social and behavioural sciences and law[2]	27,300	26,800	-1.8	15.2	24,900	22,100	-11.2	20.6
Business, management and public administration	36,100	35,100	-2.8	29.1	34,200	33,800	-1.2	18.6
Physical and life sciences and technologies	27,800	26,300	-5.4	5.8	21,500	21,100	-1.9	5.6
Mathematics and computer and information sciences	41,700	38,400	-7.9	5.1	28,500	21,600	-24.2	0.8
Architecture, engineering and related technologies	53,900	51,700	-4.1	16.0	51,200	52,800	3.1	2.4
Agriculture, natural resources and conservation	39,900	31,800	-20.3	2.1	25,900	19,800	-23.6	1.5
Health and related fields[3]	55,700	41,600	-25.3	6.6	65,600	62,000	-5.5	21.8
Other	x	x	x	x	x	x	x	x
Graduate degree (master's degree or doctorate)								
All fields of study	**56,900**	**51,500**	**-9.5**	**100.0**	**55,800**	**52,300**	**-6.3**	**100.0**
Education	69,400	70,300	1.3	9.4	63,100	63,500	0.6	30.0
Visual and performing arts and communications technologies	x	x	x	x	x	x	x	x
Humanities	42,200	24,500	-41.9	4.8	25,500	28,900	13.3	3.4
Social and behavioural sciences and law[2]	46,800	44,800	-4.3	5.3	52,800	40,000	-24.2	9.0
Business, management and public administration	60,300	56,200	-6.8	31.0	56,700	53,200	-6.2	18.4
Physical and life sciences and technologies	42,800	32,900	-23.1	5.5	38,200	39,100	2.4	6.9
Mathematics and computer and information sciences	55,900	44,400	-20.6	7.9	49,200	37,900	-23.0	5.7
Architecture, engineering and related technologies	49,500	51,000	3.0	19.2	50,900	47,900	-5.9	5.9
Agriculture, natural resources and conservation	49,400	40,000	-19.0	3.8	42,300	32,100	-24.1	4.9
Health and related fields[3]	59,100	59,900	1.4	5.2	60,800	57,700	-5.1	15.2
Other	x	x	x	x	x	x	x	x

x suppressed to meet the confidentiality requirements of the *Statistics Act*

1. The median also includes graduates with no earnings. Earnings are expressed in real terms. First-year earnings refers to employment earnings in the first calendar year following the year of graduation.

2. Undergraduate and post-bachelor non-graduate-level degrees in law (LLB, JD, BCL) were removed from the social and behavioural sciences and law grouping for this study.

3. Undergraduate and post-bachelor non-graduate-level degrees for family doctors (MD), dentists (DDS, DMD) and veterinarians (DVM) were removed from the health and related fields grouping for this study.

Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

varied between $65,600 in health and related fields and $16,700 in visual and performing arts and communications technologies. Similar variations across fields were seen for those in other cohorts.

In most fields of study, first-year earnings declined between the 2008 and 2011 cohorts. Male undergraduate degree holders with a degree in health and related fields (-25%) and education (-21%) experienced the largest declines. For their female counterparts, the largest declines were seen among those with a degree in mathematics and computer and information sciences, and education (-24% for both).

Among male graduate degree holders, the largest declines were in humanities (-42%), physical and life sciences (-23%), and mathematics and computer and information sciences (-21%). Large declines were also seen among their female counterparts with a graduate degree in social and behavioural sciences and law (-24%), agriculture, natural resources and conservation (-24%), and mathematics and computer and information sciences (-23%).

Graduates who left the Maritimes also saw declines in first-year earnings

Although all graduates examined in this article obtained their degree in one of the three Maritime provinces, one-third reported another region of residence on their tax return one year after graduating.[17] Many of those who left the Maritimes originated from outside the Maritimes, which suggests that some may have returned to their region of origin (for additional details on region of residence after graduating, see "Retention of Maritime university graduates"). Examining the first-year earnings of graduates by region of residence is important, given that labour market conditions may differ from one region to the next.

In general, graduates from Maritime universities who left the region earned more in their first year than those who stayed in the Maritimes

Table 4
Median first-year earnings[1] of Maritime university graduates, by cohort, sex, education level and region of residence one year after graduation, 2006 to 2011

	Cohort						
	2006	2007	2008	2009	2010	2011	Change between 2008 and 2011 cohorts
	median first-year earnings (2012 constant dollars)						percent
Undergraduate degree (bachelor's degree)							
Men by region of residence							
Maritimes	34,500	35,400	35,800	32,700	32,700	32,400	-9.5
Outside the Maritimes	43,400	41,900	40,800	39,300	39,300	40,100	-1.7
Women by region of residence							
Maritimes	32,500	33,200	32,900	31,400	31,500	30,500	-7.3
Outside the Maritimes	36,100	38,800	36,200	30,100	33,400	33,600	-7.2
Graduate degree (master's degree or doctorate)							
Men by region of residence							
Maritimes	50,100	53,300	55,800	50,500	49,100	50,500	-9.5
Outside the Maritimes	57,600	55,500	59,100	52,600	51,000	54,100	-8.5
Women by region of residence							
Maritimes	51,700	51,500	55,300	53,200	54,100	51,500	-6.9
Outside the Maritimes	54,700	53,600	56,500	51,000	51,700	53,800	-4.8

1. The median also includes graduates with no earnings. Earnings are expressed in real terms. First-year earnings refers to employment earnings in the first calendar year following the year of graduation.

Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

Table 5
Percentage difference in first-year earnings between the 2008 cohort and other cohorts among Maritime university graduates, by cohort and education level[1]

	Undergraduate degree (bachelor's degree)			Graduate degree (master's degree or doctorate)		
	Unadjusted gap	Adjusted gap		Unadjusted gap	Adjusted gap	
		Model A	Model B		Model A	Model B
	percent					
Cohort						
2006	-1.9	-1.8	-0.6	-5.8	-3.7	1.7
2007	-0.5	0.6	0.7	-15.8*	-13.1	-8.2
2008 (ref.)	...	...	...	...	...	...
2009	-7.6†	-7.3†	-7.8†	-9.8	-8.1	-9.4
2010	-7.7†	-7.2†	-10.0†	-13.6	-9.8	-8.4
2011	-10.1†	-8.5†	-11.1†	-3.2	2.1	0.5

... not applicable

* significantly different from reference category (ref.) ($p < 0.05$)

† significantly different from reference category (ref.) ($p < 0.10$)

1. Adjustments were calculated using a linear regression model on the Log of annual employment income and (A) the year of graduation and demographic characteristics (age, sex, immigrant status and province of graduation); and (B) all variables in (A) and the field of study.

Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

(Table 4). These gaps reflect many factors such as the differences in the characteristics of the graduates who moved compared to those who did not move, and differences in economic conditions across regions as well as the cost of living.

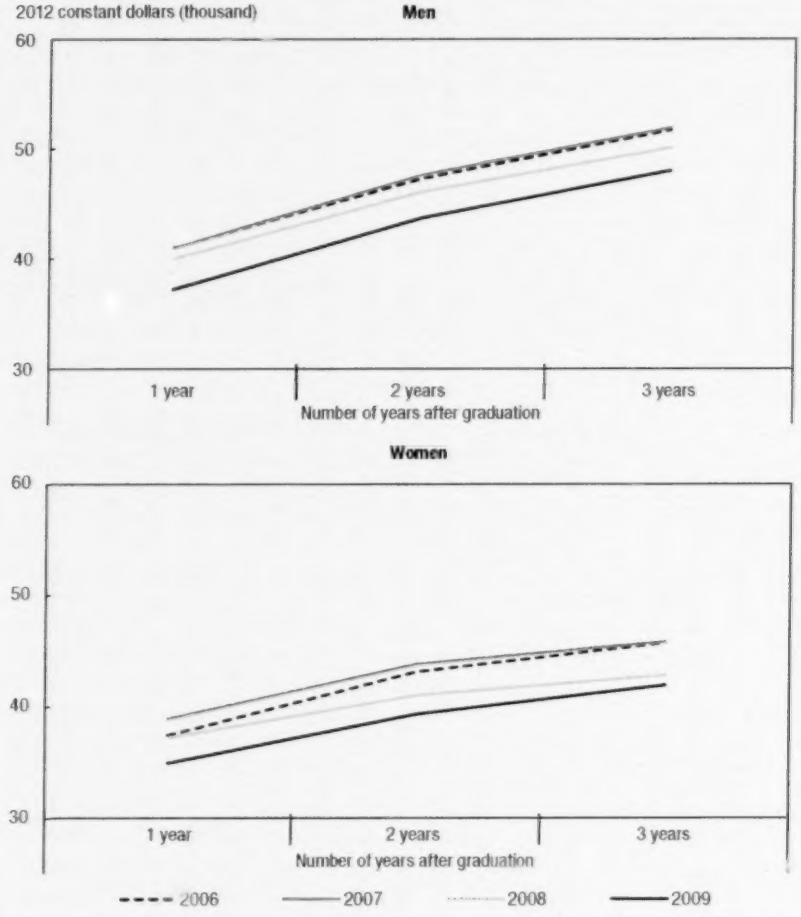
However, both stayers and leavers experienced similar declines in their first-year earnings between the 2008 and 2011 cohorts, with the exception of men with an undergraduate degree. Among them, the decline was lower for those who left (-2%) than for those who stayed (-10%).

First-year earnings declined after 2008 for undergraduate degree holders even after accounting for other factors

Which factors explain the decline in first-year earnings of graduates from Maritime universities? One possibility is the economic recession of 2008/2009, while another is the potentially changing characteristics of graduates from one cohort to the next. To isolate the possible impact of the recession, a model was estimated by taking the year of graduation into account, as well as demographic and field of study differences across cohorts (Table 5).[18]

Among undergraduates, the decline in first-year earnings remained significant for the three cohorts who graduated after 2008. This supports the view that the 2008/2009 downturn might have played a role in the declining first-year earnings of undergraduates. Even after taking demographic and field of study differences into account, undergraduate students who graduated in 2009 earned 8% less than those who graduated in 2008, while those who graduated in 2010 and 2011 earned 10% and 11% less, respectively. Among graduate degree holders, however, the differences in first-year earnings between the 2008 cohort and other cohorts were not significant.[19]

Chart 3
Median earnings of Maritime university graduates in the three years following graduation, men and women with an undergraduate degree (bachelor's degree), 2006 to 2009 cohorts



Note: These charts follow four cohorts of graduates (2006, 2007, 2008 and 2009) for three years after graduation. Each of these cohorts can be compared to the others at the same number of years after graduation as the same exclusion criteria were used for each one.
Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

Did graduates from the 2009 cohort eventually recover from the decline?

Cohorts of undergraduate degree holders were followed over three years to see if those from the 2009 cohort, who had significantly lower earnings than earlier cohorts, eventually recovered.[20]

Undergraduate degree holders of both sexes from the 2006 and 2007 cohorts followed a similar trajectory over their first three years after graduating (Chart 3). However, the next two cohorts, in 2008 and 2009, generally had lower earnings in all three years of observation compared with the preceding cohorts; the largest decline between cohorts was registered for the 2009 cohort. The gap between the cohorts did not narrow over subsequent years. This means that graduates from the 2009 cohort did not experience a decline in earnings in their first year only, but also in subsequent years.

Other studies have documented the earnings penalty associated with entering the labour market during recessionary years.[21] The lasting effects of entering the labour market during a downturn can vary, depending on the economic activity following the recessionary years. Although this study does not formally evaluate the role of the recession, the descriptive results are at least consistent with the notion that economic conditions shortly after graduation generally mattered for Maritime university graduates.

Conclusion

This article highlighted some of the results of a new dataset on the labour market outcomes of graduates of universities in Prince Edward Island, Nova Scotia and New Brunswick who earned their degree between 2006 and 2011. As the Education Longitudinal Linkage Platform (ELLP) used to create this new dataset will be developed over time, the same kind of analysis will eventually be possible at the Pan–Canadian level.

Data showed that even though most undergraduate degree holders from the Maritime universities were employed at some point during their first year after graduating, there was a clear downward trend in the first-year earnings of those who graduated in 2009, 2010 or 2011 compared with previous cohorts. The relationship with the graduation year remained significant even after accounting for differences in demographic and field of study characteristics across cohorts. Graduate degree holders also registered a decrease in their first-year earnings after 2008, but the decline was not significant after taking other factors into account.

The new dataset also showed that for some graduates, the earnings gap across cohorts did not narrow in subsequent years: three years after graduating, undergraduate degree holders from the 2009 cohort still earned significantly less than those who graduated in 2008. Future data will show whether this gap will eventually close over the years.

Lastly, the ELLP also allows for an examination of the retention patterns of university graduates from the Maritime provinces. The results of this study indicate that two-thirds of the graduates were still living in the Maritimes one year after graduating. Those in the field of education were the most likely to stay in that region while those in architecture, engineering and related technologies were the least likely to stay.

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Data sources, methods and definitions

The Postsecondary Student Information System (PSIS) provides detailed annual information on enrolments and graduations from Canadian postsecondary institutions (universities and colleges) by field of study and by certain demographic variables. However, PSIS data do not provide information about graduate outcomes on the labour market, such as labour force participation after graduation or employment earnings. This information can be derived from other administrative data sources such as the tax files.

The Statistics Canada Education Longitudinal Linkage Platform (ELLP) was developed to allow for the combination of information from PSIS, as well as the Registered Apprenticeship Information System (RAIS), with information from other datasets. A pilot study using the ELLP was undertaken to link annual PSIS graduate data for Maritime universities (for reporting years 2006 to 2012) with selected variables from the T1 Family File (T1FF) tax data (calendar years 2006 to 2012). The T1FF has the advantage of containing a large number of observations and detailed information on income sources—it does, however, have limited information on demographic and labour market characteristics. For example, it does not provide any information about the number of working hours, the number of months worked or occupational characteristics.

While the dataset of this pilot includes information for all university graduates, the current study focuses on those who were under the age of 35 at the time of graduation. Some adjustments were made to the PSIS records to simplify the matching of PSIS graduates with tax data and simplify the interpretation of the graduates' outcomes.

To improve the comparability of results across graduates, certain types of graduates were excluded from the sample if they met any of the following criteria: they were missing a tax record, went back to school as a full-time student or had self-employment earnings. The study focuses on the two of the largest groups of university graduates: those who obtained a bachelor's degree (undergraduate degree holders) and those who obtained a master's degree or a doctorate (graduate degree holders). Master's and doctorate graduates were grouped together to ensure that the sample size was sufficient. Table 6 shows the number of graduates under the age of 35 who are included in the sample.

Table 6

Number of Maritime university graduates under the age of 35 in the study population, by cohort and number of years after graduation, 2006 to 2011 cohorts

	Number of years after graduation					
	1 year	2 years	3 years	4 years	5 years	6 years
	number of graduates					
Cohort						
2006	7,105	6,030	5,315	4,835	4,500	4,240
2007	7,610	6,455	5,675	5,175	4,795	...
2008	7,390	6,330	5,645	5,100	...	...
2009	7,445	6,405	5,680	...	...	...
2010	7,145	6,125	...	...	...	...
2011	7,470	...	...	...	...	...

... not applicable

Note: In all cohorts, a number of observations are lost each year because of exclusions (e.g., missing tax data, people returning to school, or reporting self-employment income).

Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

Retention of Maritime university graduates

Knowing the proportion of graduates from Maritime universities who stay in the Maritimes after earning their degree—the retention rate of university graduates in the Maritime region—is an important question for the provincial governments since university graduates are among the most mobile Canadians.[22]

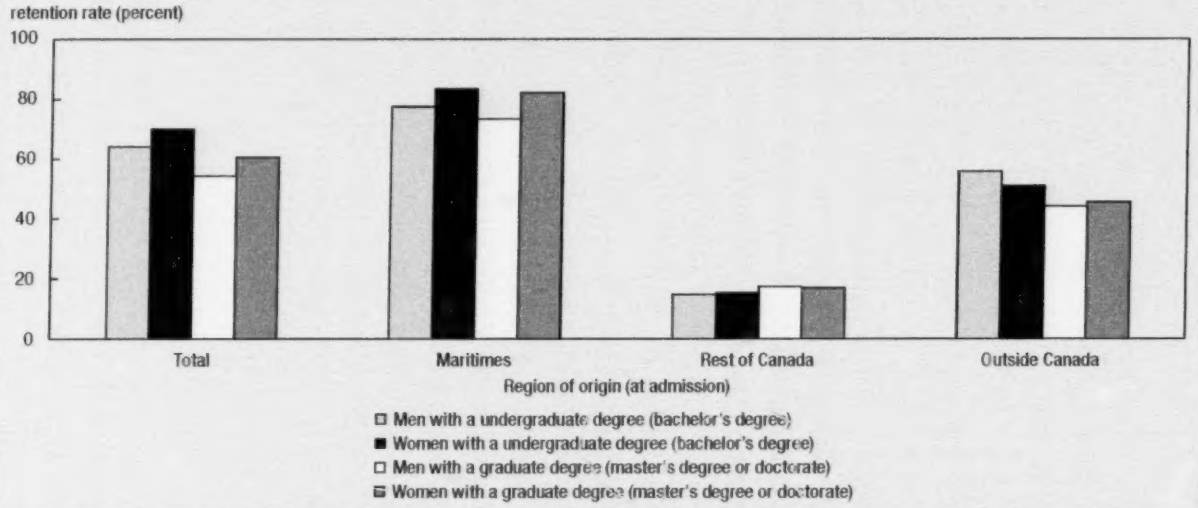
Retention rates in the year following graduation were examined by region of origin, sex and field of study, and are based on graduates who completed a valid tax return, reported no self-employment income and did not pursue their education further on a full-time basis. All cohorts were combined since retention rates did not vary much across cohorts.

Higher retention rates are expected among graduates who were already living in the Maritimes at the time of their admission given family ties, friendships and other bonds they developed there. Conversely, students from other Canadian provinces and territories or from outside Canada might have a greater likelihood of returning to the place of residence that they reported at the time of admission, resulting in a lower Maritime retention rate among them.

Retention rates of undergraduates tended to be higher among women (70%) than men (64%) (Chart 4). As expected, retention rates were highest for undergraduates whose place of residence at the time of admission was the Maritimes (83% for women and 77% for men), while it was lowest for those who lived elsewhere in Canada at the time of admission (15% for both men and women). Among those who came from outside the country (and filed a tax return after graduating), more than one-half stayed in the Maritimes after graduating (51% of women and 56% of men).[23] Similar patterns were found among graduate degree holders.

Retention of Maritime university graduates (continued)

Chart 4
Retention rate of Maritime university graduates one year after graduation, by level of education and region of origin, all cohorts from 2006 to 2011



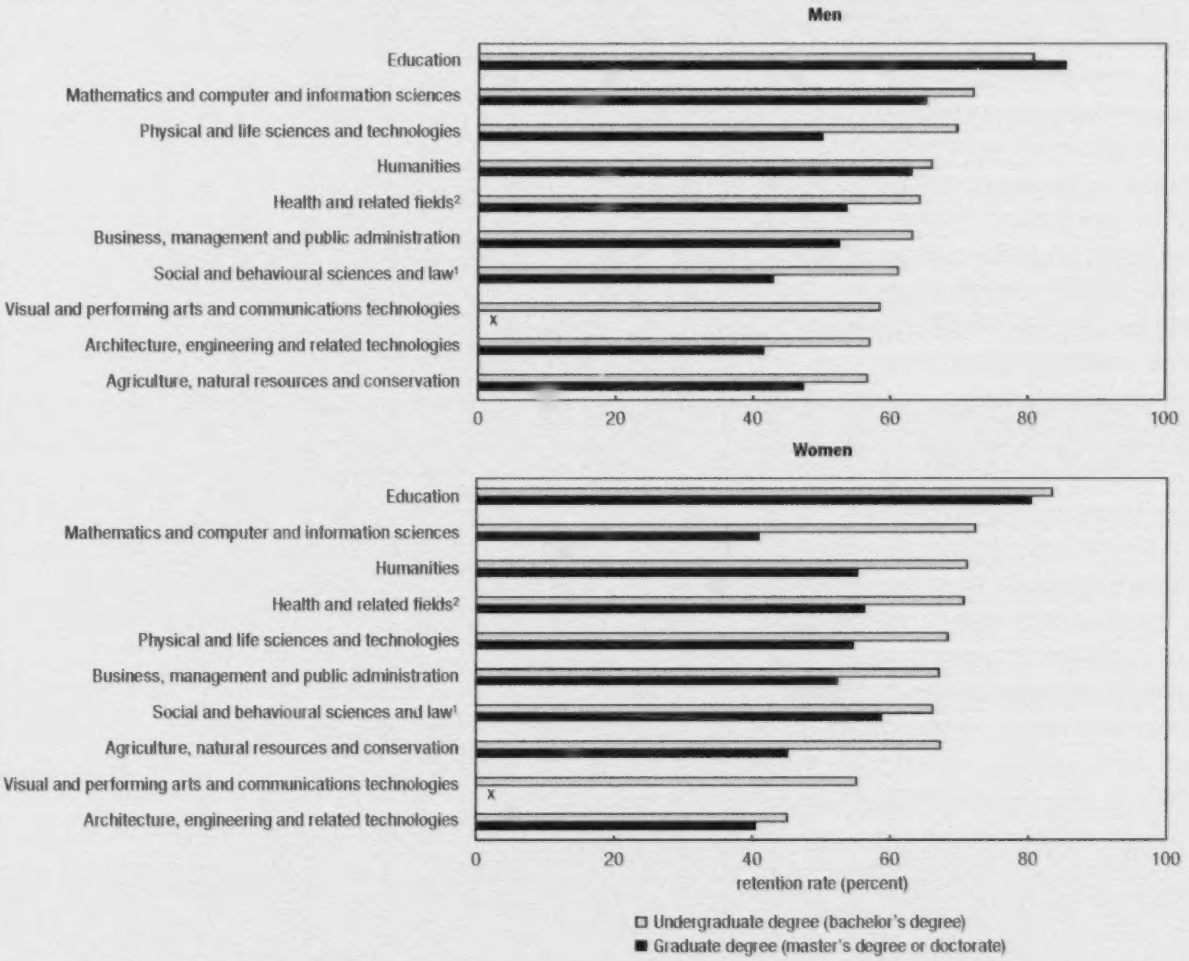
Note: The retention rate is defined as the proportion of graduates still living in one of the three Maritime provinces one year after graduation out of all Maritime university graduates.
Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

High retention rates may also be linked to the key industries and occupations in a given region, and to economic fluctuations in those industries. Similarly, employment opportunities in specific industries located in other regions of Canada may also explain why some graduates choose to leave.

This partly explains why retention rates also vary by field of study. Graduates from education programs, for example, had the highest retention rates, regardless of gender or education level (Chart 5). Other fields such as mathematics and computer and information sciences; humanities; and health and related fields also had relatively high retention rates among men and women. In contrast, graduates from architecture and engineering programs had the lowest retention rates among women and the second lowest among men. The economic prosperity of Western Canada from 2007 to 2012, fostered by the exploitation of natural resources, may have attracted a number of graduates from Maritime universities during those years.

Retention of Maritime university graduates (concluded)

Chart 5
Retention rate of Maritime university graduates one year after graduation, by level of education and field of study, all cohorts from 2006 to 2011



x suppressed to meet the confidentiality requirements of the *Statistics Act*
1. Undergraduate and post-bachelor non-graduate-level degrees in law (LLB, JD, BCL) were removed from the social and behavioural sciences and law grouping for this study.
2. Undergraduate and post-bachelor non-graduate-level degrees for family doctors (MD), dentists (DDS, DMD) and veterinarians (DVM) were removed from the health and related fields grouping for this study.
Note: This refers to the proportion of graduates under the age of 35, out of all graduates of the Maritime universities, who were still living in one of the three Maritime provinces one year after graduation.
Sources: Statistics Canada, Postsecondary Student Information System (PSIS), 2005/2006 to 2011/2012; T1 Family File (T1FF), 2006 to 2012.

Notes

1. See Ferguson and Wong (2014).
2. See Kahn (2010); Oreopoulos et al. (2012).
3. This pilot project was undertaken by Statistics Canada on behalf of and in collaboration with the Forum of Labour Market Ministers (FLMM) Labour Market Information (LMI) working group members from the Maritime provinces (Nova Scotia, New Brunswick and Prince Edward Island), Employment and Social Development Canada (ESDC), as well as the Maritime Provinces Higher Education Commission (MPHEC). The information from all provinces and territories will eventually be added to the dataset, making it possible to examine the labour market outcomes of the graduates for most Canadian universities.
4. The dataset used in this article was specially created for the pilot project. At the time of the project, the ELLP could only be linked to tax data up to 2012. Since PSIS graduate data were available from 2006 to 2011, the observation period covers the years from 2006 to 2012.
5. In this study, the population of interest is restricted to graduates who obtained their degree before the age of 35 in order to focus on graduates with no or little labour market experience prior to graduation. Of all taxfilers who completed a university degree in the Maritimes from 2006 to 2011, the vast majority (91%) were under 35. Graduates with a bachelor's degree were younger—96% of them were under 35. This compares with 74% for graduates with a master's degree or a doctorate.
6. Those who pursued additional postsecondary education after graduating were identified using the education tax credits from the tax records. Full-time students were excluded from the analysis as they would not have the same education level as the other graduates.
7. Graduates with self-employment earnings were excluded the first year they reported self-employment income and all subsequent years because they sometimes report negative income on their tax return. The self-employed are identified as anyone with positive gross self-employment income. On average, less than 5% of graduates of the Maritime provinces who completed an income tax return and had not pursued further full-time education reported self-employment income one year after graduating.
8. All graduates covered by this article meet the same criteria—the year after graduating they had all completed a valid tax return, had reported no self-employment income and had not pursued their education further on a full-time basis. In other words, of the 74,850 individuals under the age of 35 who graduated from 2006 to 2011 with a bachelor, a master's degree or a doctorate, 9,940 were removed from the sample because they had not completed a valid tax return; 18,230 were excluded as they had pursued their education full-time; and an additional 2,510 were excluded since they had reported self-employment income. The analysis in this article was therefore based on the remaining graduates (more than 44,000). Readers should note that, in some fields of study, graduates were more likely to pursue their education full-time, which was the case for 28% of bachelor degree graduates in social and behavioural sciences; 22% of those in humanities; and 20% of those in physical and life sciences and technologies. Conversely, only 2% of the graduates with a bachelor degree in mathematics and computer and information sciences pursued their education full-time.
9. The number of graduates receiving EI benefits could exclude some of the unemployed as certain graduates may not qualify for EI benefits if they worked too few hours during the qualifying period. Conversely, EI also covers maternity and parental leave benefits, and it is not possible to identify the type of EI benefit received.
10. In this article, earnings refers to employment earnings only as those with self-employment earnings are excluded from the analysis. All earning figures are expressed in real 2012 dollars and have been deflated by using the all-items Consumer Price Index (CPI).
11. Among all Canadians aged 25 to 34, real median annual earnings decreased from $34,800 to $34,200 between 2008 and 2009. Those with no earnings are excluded from this calculation, which may explain why the decline is more modest than in the case of new graduates.
12. See Larochelle-Côté and Gilmore (2009).

13. This industry grouping was also used in Morissette (2008). Even if not all jobs in these industries are low skilled, the wages and benefits in these sectors are typically lower than in other industries and the positions are more likely to be low skilled. According to the 2012 Labour Force Survey, the average hourly wage of all employees aged 15 and over was $23.55, while the average was the lowest in the following industry groupings: food and accommodation ($13.63), and wholesale and retail trade ($17.70). Unionization rates were the lowest in wholesale and retail trade (13.9%) and food and accommodation (6.9%), compared with 31.3% for all paid workers.

14. See Frank et al. (2015); Frenette and Frank (2016); Ostrovsky and Frenette (2014).

15. Health excludes family doctors (MDs), dentists and veterinarians. Some fields of study, such as agriculture and arts, have a relatively large proportion of self-employed individuals. In this article, individuals who reported self-employment income are excluded from the calculations.

16. The tax data do not provide occupational information. Graduates who received their degree in some fields of study may be more at risk of skill mismatch, which may explain some of the earnings differences by field of study.

17. The T1FF provides information on the region of residence of graduates, which may differ from the region where they worked the year after graduating.

18. The adjusted wage gaps were based on a linear regression model of the log of annual employment earnings on (A) the year of graduation and demographic characteristics (age, sex, immigrant status and province of graduation); and (B) all the variables in (A) plus the field of study.

19. Other studies (Frank et al. 2015; Finnie et al. 2016) found little or no evidence of a decline in outcomes over the recessionary years. However, neither of those studies focus on Maritime university graduates. In addition, the universe in this study is different from the other two studies—in Frank et al., the universe is not necessarily made up of new graduates, and in Finnie et al., the universe includes graduates from a selection of universities in Ontario, Alberta and British Columbia.

20. The dataset used in this article was specially created using the ELLP, which, at the time of the pilot project, could only link PSIS data to tax data up to 2012. Longitudinal analysis requires that the graduates of each cohort be followed over the same number of years to avoid any bias. The four cohorts that graduated from 2006 to 2009 were chosen as it was possible to follow each of them over three years.

21. See, for example, Oreopoulos et al. (2012).

22. See Statistics Canada (2008); Turcotte and Weeks (2014).

23. Readers should note that international graduates exclude a significant number of graduates who never filed an income tax return in Canada after graduating. The Maritime retention rates for this category must therefore be interpreted with caution.

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